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Amphicyon, Dinocyon, Cephalogale, Simocyon, Oligobunis, and probably Enhydrocyon. In the Canidæ, Dr. Schlosser appears to us to admit too many genera; at least we cannot clearly make out generic differences from his descriptions. On the other hand the genera of Mustelidæ, though numerous, are sharply defined. We note a couple of errors in the matter of American species. *Canis brachypus* Cope is not an Eocene, but an upper Miocene species (Ticholeptus beds). *Aelurodon ferox* and *Canis saevus* cannot be well referred to different families, as they were established on the superior and inferior molars of the same species. Four plates accompany this memoir.—*E. D. Cope.*

MINERALOGY AND PETROGRAPHY.[1]

Petrographical News.—There have recently appeared two interesting papers upon the Cortlandt series of eruptive rocks, and the changes they produce in the surrounding mica-schists and limestones. The first paper is by Mr. J. F. Kemp,[2] who reports the results of his examinations of an extension of the series west of Stony Point, N. Y. He finds the eruptives to be of the same general character as those described by Dr. Williams,[3] from near Peekskill. In one of these he notices the alteration of brown hornblende into green augite. He further finds that limestone upon the contact with these eruptives has undergone an alteration, during the course of which tremolite has been developed. Dr. Williams's[4] paper deals with the contact phenomena observed in the rocks surrounding the eruptives in the Stony Point region. The unaltered mica-schists consist of quartz, biotite, muscovite, a little feldspar, tourmaline, and occasionally zircon. Upon approaching the eruptives they lose their foliation and have developed in them: garnet, sillimanite, staurolite, scapolite, cyanite, margarite, ripidolite and corundum. The *sillimanite* is found in radiating bundles of fibres. The *ripidolite* (or clinoclor) is derived from the biotite of the schists. The *margarite* has the macroscopic appearance of muscovite. In the thin section, it is distinguished from this mineral by its high refractive index, its extinction of 6°–10°, its numerous twins parallel to oP, and its large optical angle (114½° in air). Its composition is:—

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[1] Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.
[2] Amer. Jour. Sci., Oct., 1888, p. 247.
[3] Cf. Amer. Naturalist, 1886, p. 275; 1887, p. 569.
[4] Amer. Jour. Sci., Oct., 1888, p. 254.

SiO_2	Al_2O_3	FeO	CaO	MgO	H_2O
32.73	46.58	5.12	11.04	1.00	4.49

The paper contains many points of interest, and is a final, incontrovertible proof of the eruptive character of the massive rocks of the Cortlandt series.—In a paper in which the origin of quartz in basalts is discussed, Mr. Iddings[1] describes the microscopic appearance of quartz-bearing basalts from the Rio Grande cañon in New Mexico. Most of these are holocrystalline. They contain plagioclase, augite, magnetite, olivine and rounded quartzes. The quartz is usually surrounded by shells composed of little augite crystals, which extend out into the body of the rock, and are sometimes partly included within the feldspar. It has the characteristics of the porphyritic crystals of more acid volcanic rocks, and is regarded as original. The main portion of the paper is taken up with the discussion of the conditions under which the production of porphyritic quartz crystals might take place in a rock as basic as basalt. After a thorough examination into the effects which temperature, pressure, and the presence of water vapor exert upon the crystallization of a molten magma, Mr. Iddings concludes that the quartzes owe their origin to certain physical conditions attending an early period of the magma's existence; and that of these the most important is the presence of water vapor under pressure. In the same paper the writer describes two new occurrences of quartz basalt. The first is a red compact rock from the vicinity of Santa Maria Basin, in Arizona. The second is a dark-colored, fine-grained rock from the S. E. base of Anita Peak, Colorado.—Kroustchoff[2] has recently described an inclusion in the basalt from Wingendorf, in Silesia, which differs from most basalt inclusions in that it contains anorthite. This mineral and enstatite make up the larger part of the inclusion, which contains in addition to these, augite, diallage, olivine and various spinels. The *enstatite* was separated and analyzed:—

SiO_2	Al_2O_3	FeO	MgO	CaO	Alkalies	Loss
56.96	.79	3.11	33.65	4.32	tr.	.26

—A coarse-grained pyroxene-syenite,[3] from near Gröbe, in Saxony, is composed of orthoclase, plagioclase, augite and biotite, with some quartz and hypersthene. The orthoclase occurs in porphyritic crystals, while the plagioclase is found only in the ground mass. In finer grained streaks throughout the rock the augite has all been replaced by hornblende.—In an article on Mount Lupara, a crater in the Flagraian Fields, near Naples, Deecke[4] describes augite-trachyte and augite-trachyte glasses, which present no features different from those observed in the lavas of other craters in this region.—Mr. E. O. Hovey[1] reports the discovery of a cordierite gneiss at Guilford, sixteen miles east of New Haven, Conn. The cordierite has a deep blue color in the hand specimen, but under the microscope is colorless and very fresh. It contains as inclusions only sillimanite needles.—Lacroix and Baret[2] mention a pyroxenite from near Saint Nazaire, Loire-Inférieure, France, that is composed essentially of a granular mixture of augite, scapolite and sphene.—The microscopical examination and the determination of some of the physical constants of several sandstones, a marble and a tufa from California, have been made by Prof. A. W. Jackson,[3] of the University of California.

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[1] Amer. Jour. Sci., Sept., 1888, p. 208.

[2] Min. u. Petrog. Mitth., x., 1887, p. 329.

[3] Klemm: Zeits. d. deutsch. geol. Gesell., xl., 1888, p. 184.

[4] Ib., xl., p. 166.

NEW MINERALS—HOHMANNITE AND AMARANTITE.—In a mass of copiapite from near Caracoles, in Chili, Frenzel[4] has discovered two new iron sulphates. One has been called *hohmannite* after its discoverer. This is an opaque chestnut-brown fibrous mineral, with a vitreous lustre. Its hardness is 3; specific gravity, 2.24, and its streak a yellow ochre color. Its composition may be represented by $Fe(FeO)(SO_4)_2 + 7H_2O$. It is insoluble in water, readily undergoes alteration, and loses 7.63 per cent. of water when placed in a dessicator over calcium chloride. The second mineral, *amarantite*, is probably identical with the first, although the author prefers to designate it by a separate name because of its different physical and chemical properties. Amarantite occurs in orange-colored microscopic crystals of the triclinic system.[5] They have a citron-yellow streak, and a specific gravity of 2.11, and do not as readily undergo decomposition as does hohmannite.—*Riebeckite.* In a flesh-red granite from the Island of Socotro, in the Indian Ocean, a hundred and fifty miles from Cape Gardafui, Sauer[6] has found a hornblende which corresponds exactly to aegerine among the augites. Its negative bisectrix (instead of positive as in the other hornblendes) is inclined 5° to the vertical axis, its pleochroism is vr = dark blue; t = green; pi = blue, and its composition:—

SiO_2	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O
50.01	28.30	9.87	.63	.34	1.32	8.79	.72

Sauer calls attention to the fact, so often overlooked, that the formula of *arfvedsonite*, which is usually regarded as equivalent to aegerine, is based upon an analysis which is really that of aegerine itself.—*Beryllonite.* In a preliminary note Prof. E. S. Dana[1] suggests the name *beryllonite* for a mineral with the composition $Na\,Be\,Po_4$, occurring in orthorhombic crystals with a tabular habit, a hardness of 5.5–6, and a specific gravity 2.84. The mineral is colorless or white, and has several perfect cleavages. A full description of its characteristics, as well as of its occurrences, is promised in the near future.—*Edisonite*—a fourth form of titanic oxide (a fifth form if Mr. Diller's[2] mineral is found to consist of TiO_2)—is described by Mr. Hidden[3] from the concentrates of placer washings in Polk county, N. C., and at Pilot Mountain, Burke county, in the same State. It crystallizes in the orthorhombic system like *brookite*, but its axial ratio, as calculated by Des Cloizeaux, is .99275 : 1 : .92337. The color of the mineral is yellow or brown, its hardness about 6, specific gravity 4.285, and streak yellowish white.

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[1] Amer. Jour. Sci., July, 1888, p. 57.
[2] Bul. Soc. Franç. d. Min. x., p. 288.
[3] Seventh Ann. Rep. State Mineralogist, Sacramento, 1888, p. 205.
[4] Min. u. Petrog. Mitth., ix., 1888, pp. 397, 423.
[5] Wülfing: ib., p. 401.
[6] Zeits. d. deutsch. geol. Gesell., 1888, xl., p. 138.

RARE MINERALS.—*Bertrandite.* Heretofore this mineral has been found only in small crystals at various localities in Europe, and its crystallographic characteristics have not been thoroughly investigated. A new find at Mt. Antero, Colorado, affords Mr. Penfield[4] a crystal of sufficient size to admit of exact measurements of the crystallographic constants. According to Mr. Penfield, the mineral is orthorhombic with $a : b : c = .5723 : 1 : .5953$, and $2H = 101° \, 10'$ for yellow light. The hemimorphic development of the basal plane cannot be explained. The crystals are attached to quartz, and are associated with phenacite, orthoclase, muscovite and fluorite. They have a hardness of 6–7, a specific gravity of 2.598, and consist of:—

SiO_2	BeO	CaO	H_2O
51.8	39.6	1.0	8.4

Piedmontite. The optical properties of the manganese epidote piedmontite have recently been very carefully studied by Dr. Kotô,[5] of Japan, who finds it quite wide spread as a constituent of Japanese rocks. In a piedmontite-schist consisting of quartz, piedmontite, muscovite, garnet, rutile, feldspar, etc., the piedmontite is well crystallized with oP, $\infty P\overline{\infty}$, $\frac{1}{2}P\overline{\infty}$, P, and $P\overline{\infty}$ predominating. The mineral has an extinction of 3°, and is pleochrois as follows: vr = deep reddish violet; t = brownish red; pi = light violet. The absorption is vr > t > pi, whereas in common epidote it is t > pi > vr. An analysis yielded:—

SiO_2	Al_2O_3	Fe_2O_3	Mn_2O_3	CaO	MgO	K_2O	Na_2O	H_2O
36.16	22.52	9.33	6.43	22.05	.40	tr.	.44	3.20

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[1] Amer. Jour. Sci., Oct., 1888, p. 290.

[2] Cf. Amer. Naturalist, Feb., 1888, p. 169.

[3] Amer. Jour. Sci., 1888, Oct., p. 272.

[4] Ib., July, p. 52.

[5] Quart. Jour. Geol. Soc., Aug., 1887, p. 474.

The same mineral is an accessory constituent of a glaucophane rock from Japan. It has recently been described, by Haworth,[1] as occurring in a porphyrite from Missouri, and is also mentioned by Lacroix[2] as existing in the mica-schists of the Island of Groix, off the coast of France.—*Emmonsite.* Near Brixlegg, in the Unterinnethal, is a mineral, occurring in little spherical groups of crystals implanted on barite. Its analysis gave 86.89 per cent. of $SrCO_3$, and 13.14 per cent. of $CaCO_3$, thus agreeing very closely with Thomson's *emmonsite* from Massachusetts. Cathrein[3] has measured the crystals, and found them to consist of rhombic prisms with $a : b : c = .6090 : 1 : .7236$.—*Diamonds and Sapphires.* A new discovery of diamonds and sapphires is reported[4] from Australia. The location where they have been found is Invere, New South Wales. They are found in a sand made up of quartz and tourmaline, and pieces of a rock composed of the same minerals.—*Leucite.* Prof. Judd[5] announces the discovery of leucite by Mr. T. W. E. David in a leucite-basalt from Byrock, N. S. Wales, Australia, about 450 miles N. W. from Sydney. Leucite, which until a few years ago was not known outside of Europe, is now known to occur in each one of the continents with the exception of Africa.—*Cryptolite,* the rare cerium phosphate, according to Mallard,[6] is nothing but *monazite* with a habit differing slightly from that which this mineral usually affects.—*Gadolinite* has been found, by Lacroix,[7] in a cavity in the granitite of the Mourne Mountains, Ireland, and *allanite* has been discovered, by Levy and Lacroix,[8] in a granite from Pont Paul, Finistère.

CRYSTALLOGRAPHIC NEWS.—In the course of an investigation of minerals from the Tyrol, Cathrein[9] detected in them several new planes. On a yellow-brown *garnet,* from Rothenkopf, $\frac{8}{3}O\frac{8}{5}$ was found. This form is especially interesting, because it is not only new to garnet, but also to the entire regular system. The new triakistetrahedron— $\frac{\frac{17}{9}O\frac{17}{9}}{2}$ occurs on *tetrahedrite* from Kogel, near Brixlegg; $\frac{39}{38}P\bar{\infty}$, $\infty P\bar{2}$ and $\frac{1}{7}P\breve{\infty}$ on *adularia* from Schwarzenstein; and $P\bar{\infty}$ on *diaspore* from Grenier.—In an elaborate paper on the crystallography of *dolomite* Becke[10] announces the discovery of the new forms $+\frac{r}{l}\frac{\infty R 3}{2}, +\frac{r}{l}\frac{4 R 3}{2}, -\frac{e}{r}\frac{2 R 3}{2}, -\frac{l}{r}\frac{R \frac{13}{3}}{2}, -\frac{l}{r}\frac{8 R 3}{2}, +\frac{l}{r}\frac{4 R 3}{2}, +\frac{l}{r}\frac{\infty R 3}{2}$. As indicated by these formulas, Becke finds dolomite to be rhombohedrally tetrahedral. In addition to the full lists of forms occurring on the mineral, there is in the paper a full discussion of its vicinal planes. —*Pyrite*[1] crystals from the clay slates near Trofajach in Steiermark, contain the new plane $\frac{\infty O 6}{2}$. Michel[2] claims that crystals of the selenates of barium, strontium, calcium and lead are isomorphous with the natural sulphates of the corresponding metals.

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[1] Amer. Naturalist, Aug., 1888, p. 732.
[2] Bull. d. l. Soc. Franç. d. Min., xi., p. 148.
[3] Zeits. d. Kryst., xiv., p. 366.
[4] Friedel: Bull. Soc. Franç. d. Min., xl., p. 64.
[5] Geol. Magazine, May, 1888, p. 193.
[6] Bull. Soc. Franç. d. Min., x., p. 236.
[7] Ib., xi., p. 68.
[8] Ib., xi., p. 65.
[9] Min. u. Petrog. Mitth., x., p. 52.
[10] Ib., x., p. 73.

MISCELLANEOUS.—Prof. Judd[3] has recently demonstrated in a very interesting paper that quartz may have secondarily developed in it a lamellar structure analogous to that which is so frequently produced in feldspar by pressure. The lamellæ in quartz are best brought out by etching. By studying the images reflected from the etched surfaces, Judd discovered that lamellæ existed only where the crystal examined had suffered injury; that the lamellæ were parallel to R and —R, which may be regarded as gliding planes; and finally that the change produced in the internal structure of the quartz consisted in a change in the nature of the circular polarization of the alternate lamellæ, and not in such a change as takes place in the development of twinning lamellæ in calcite and feldspar. It is thought that the planes along which a quartz crystal breaks when heated and suddenly cooled may be these gliding planes.—Prof. Crosby[4] discusses the origin of the silica that is often found cementing the grains in a sandstone, and suggests that it might result from the solution of siliceous organisms, which are everywhere abundant in the waters of the oceans, and may with some probability be assumed as occurring in the waters in which the sandstones were deposited.—Dr. E. A. Schneider[5] urges the importance of studying the effect of acids (especially hydrochloric) upon silicates, with the view of determining their constitution in a manner analogous to that so frequently made use of in organic chemistry for the purpose of determining the nature of the inner structure of carbonaceous substances.—Becke[6] proposes a method for distinguishing between quartz and feldspar in rock sections. It depends upon the fact that the former mineral is entirely dissolved by hydrofluoric acid, while the latter yields an amorphous aluminium fluosilicate, which can be stained with a solution of some aniline color.

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[1] Hoefer: Ib., x., p. 157.
[2] Bull. d. l. Soc. Franç. d. Min., xi., p. 182.
[3] Miner. Magazine, 1888, p. 1.
[4] Technology Quarterly, May, 1888, p. 397.
[5] Amer. Chem. Jour., x., p. 405.
[6] Min. u. Petrog. Mitth., x., p. 89.